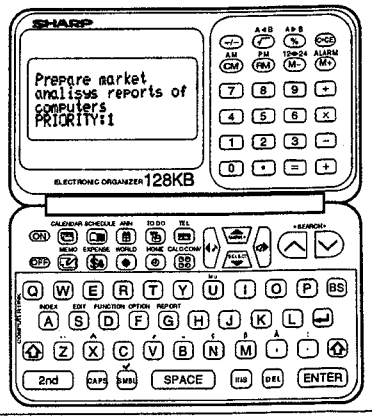
ZQ-4400
ZQ-4450

SHARP SERVICE MANUAL

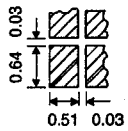
CODE: 00ZZQ4450SM/E

ZQ-4400
MODEL ZQ-4450

KEY LAYOUT



KEY SYSTEM: Rubber key

	STANDARD FUNCTION	10 digits 1 M
DISPLAY SECTION	ELEMENT: FEM LCD	PARTS NAME: LF7841Q
	NUMERAL: 20 digits (4 lines)	
	 (mm)	119 x 32 dot matrix liquid crystal display 20 columns x 4 lines (with 6 x 8 dot characters)

LSI	CPU: LI35101F (253pin-FILM)	
	SRAM: CXK58257AM-12L (x2)	

POWER SUPPLY	AC: X	DC: O

Main power supply:
6 VDC lithium batteries (CR2032 x 2)
Memory backup power:
3 VDC lithium battery (CR2032 x 1)

AC ADAPTOR	
RECHARGEABLE BATTERY	
POWER CONSUMPTION	0.01 W
AUTO POWER OFF TIME	Approx. 7 minutes
MEMORY PROTECT	Yes

DIMENSIONS(mm)

Open: 138(W) x 160.2(D) x 9.3(H) mm.
Closed: 138(W) x 80(D) x 17.5(H) mm.

Weight: Approx. 155g (including batteries)

CALCULATIONS

addition, subtraction, multiplication, division; constant, square root, percent, memory calculation, etc.

Accessories

Lithium batteries (CR2032 x 3)
Operation manual

Electronic notebook section

TEL mode	Entry and recall of names, phone numbers, and addresses
SCHEDULE mode	Entry and recall of dates, appointment times, and details of appointments Automatic day-forward function, schedule alarm function
ANNIVERSARY mode	Entry and recall of dates and details of anniversaries Anniversary notice function
CALENDAR mode	Display of calendars from January 1901 to December 2099 Schedule mark function distinguishing between morning and afternoon appointments Anniversary mark function
MEMO mode	Entry and recall of everyday memos
TO DO mode	Entry and recall of items, priority assignment
EXPENSE mode	Entry and recall of expense date, amount, payment type and description
Memory capacity	128 Kbytes (User area: Approx. 126 Kbytes) SCHEDULE mode capacity: Approx. 2120 entries TEL mode capacity: Approx. 3400 entries MEMO mode capacity: Approx. 950 entries • The approximate entry capacities above assume the following average entry sizes when all memory is used by a single mode. SCHEDULE Description 32 characters/entry TEL Name 16 characters/entry Number 12 characters/entry MEMO 128 characters/entry
Maximum character string length per entry	512 characters
Other features	Secret function, data transfer, index display

Clock

Crystal oscillation frequency	32,768 Hz
Clock precision	Average variance ±60 seconds per month (at 25°C/77°F)
Content of displays	year, month, day, day of week, hours, minutes, A.M./P.M.
Time system	12-hour and 24-hour clock

Operating time

- Approx. 1200 hours
  When data is continuously displayed at an ambient temperature of 20°C (68°F).
- Approx. 800 hours
  When data is searched for 5 minutes per hour, and the data is displayed for 55 minutes per hour, at an ambient temperature of 20°C (68°F).
- When off, and the clock is running, operating time: Approx. 1.5 year
- Memory backup battery life:
  Approx. 5 years (if operating batteries are replaced promptly when exhausted)
  Approx. 3 years (if operating batteries are exhausted or not installed)

SHARP CORPORATION

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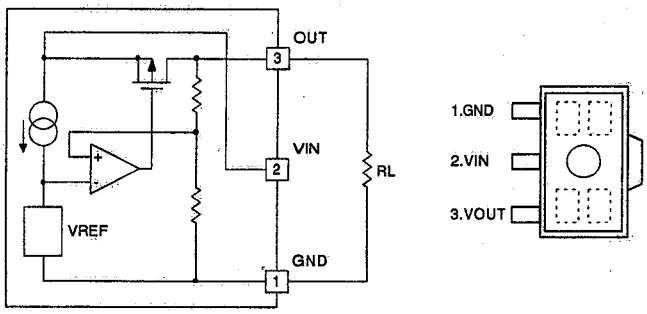
1. CPU (LI35101F) terminal description

Signal name	I/O	Terminal name	Signal name	I/O	Terminal name	Signal name	I/O	Terminal name	Signal name	I/O	Terminal name
TEST2	I	Test input	AD5	O	Address output	S20	O	Segment output	S80	O	Segment output
TEST1	I	Test input	AD4	O	Address output	S21	O	Segment output	S81	O	Segment output
STB0	O	Strobe output	AD3	O	Address output	S22	O	Segment output	S82	O	Segment output
STB1	O	Strobe output	AD2	O	Address output	S23	O	Segment output	S83	O	Segment output
STB2	O	Strobe output	AD1	O	Address output	S24	O	Segment output	S84	O	Segment output
STB3	O	Strobe output	EO1	O	Output port	S25	O	Segment output	S85	O	Segment output
STB4	O	Strobe output	BZ1	O	Buzzer output	S26	O	Segment output	S86	O	Segment output
STB5	O	Strobe output	EO2	O	Output port	S27	O	Segment output	S87	O	Segment output
STB6	O	Strobe output	KI8	I	Key input	S28	O	Segment output	S88	O	Segment output
STB7	O	Strobe output	KI7	I	Input port	S29	O	Segment output	S89	O	Segment output
STB8	O	Strobe output	GND		Power source	S30	O	Segment output	S90	O	Segment output
STB9	O	Strobe output	φOUT	O	Clock output	S31	O	Segment output	S91	O	Segment output
STB10	O	Strobe output	XO	O	Crystal oscillation output	S32	O	Segment output	S92	O	Segment output
STB11	O	Strobe output	XI	I	Crystal oscillation input	S33	O	Segment output	S93	O	Segment output
STB12	O	Strobe output	GND		Power source	S34	O	Segment output	S94	O	Segment output
STB13	O	Strobe output	VD		Crystal oscillation power source	S35	O	Segment output	S95	O	Segment output
STB14	O	Strobe output	VCC		Power source	S36	O	Segment output	S96	O	Segment output
STB15	O	Strobe output	VFF		LCD drive power source	S37	O	Segment output	S97	O	Segment output
RESET	I	Reset input	VHH		LCD drive power source	S38	O	Segment output	S98	O	Segment output
KI13	I	Key input	VR		LCD drive power source	S39	O	Segment output	S99	O	Segment output
KI12	I	Key input	VH		LCD drive power source	S40	O	Segment output	S100	O	Segment output
KI11	I	Key input	V1		LCD drive power source	S41	O	Segment output	S101	O	Segment output
KI10	I	Key input	V2		LCD drive power source	S42	O	Segment output	S102	O	Segment output
KI9	I	Key input	V3		LCD drive power source	S43	O	Segment output	S103	O	Segment output
KI6	I	Key input	V4		LCD drive power source	S44	O	Segment output	S104	O	Segment output
KI5	I	Key input	H16	O	Common output	S45	O	Segment output	S105	O	Segment output
KI4	I	Key input	H15	O	Common output	S46	O	Segment output	S106	O	Segment output
KI3	I	Key input	H14	O	Common output	S47	O	Segment output	S107	O	Segment output
KI2	I	Key input	H13	O	Common output	S48	O	Segment output	S108	O	Segment output
KI1	I	Key input	H12	O	Common output	S49	O	Segment output	S109	O	Segment output
DI08	I/O	Data I/O	H11	O	Common output	S50	O	Segment output	S110	O	Segment output
DI07	I/O	Data I/O	H10	O	Common output	S51	O	Segment output	S111	O	Segment output
DI06	I/O	Data I/O	H9	O	Common output	S52	O	Segment output	S112	O	Segment output
DI05	I/O	Data I/O	H8	O	Common output	S53	O	Segment output	S113	O	Segment output
DI04	I/O	Data I/O	H7	O	Common output	S54	O	Segment output	S114	O	Segment output
DI03	I/O	Data I/O	H6	O	Common output	S55	O	Segment output	S115	O	Segment output
DI02	I/O	Data I/O	H5	O	Common output	S56	O	Segment output	S116	O	Segment output
DI01	I/O	Data I/O	H4	O	Common output	S57	O	Segment output	S117	O	Segment output
CE3	O	Chip enable output	H3	O	Common output	S58	O	Segment output	S118	O	Segment output
CE2	O	Chip enable output	H2	O	Common output	S59	O	Segment output	S119	O	Segment output
CE1	O	Chip enable output	H1	O	Common output	S60	O	Segment output	S120	O	Segment output
R/W	O	Read/Write output	S1	O	Segment output	S61	O	Segment output	H33	O	Common output
BA08	O	Bank address output	S2	O	Segment output	S62	O	Segment output	H17	O	Common output
BA07	O	Bank address output	S3	O	Segment output	S63	O	Segment output	H18	O	Common output
BA06	O	Bank address output	S4	O	Segment output	S64	O	Segment output	H19	O	Common output
BA05	O	Bank address output	S5	O	Segment output	S65	O	Segment output	H20	O	Common output
BA04	O	Bank address output	S6	O	Segment output	S66	O	Segment output	H21	O	Common output
BA03	O	Bank address output	S7	O	Segment output	S67	O	Segment output	H22	O	Common output
BA02	O	Bank address output	S8	O	Segment output	S68	O	Segment output	H23	O	Common output
BA01	O	Bank address output	S9	O	Segment output	S69	O	Segment output	H24	O	Common output
AD15	O	Address output	S10	O	Segment output	S70	O	Segment output	H25	O	Common output
AD14	O	Address output	S11	O	Segment output	S71	O	Segment output	H26	O	Common output
AD13	O	Address output	S12	O	Segment output	S72	O	Segment output	H27	O	Common output
AD12	O	Address output	S13	O	Segment output	S73	O	Segment output	H28	O	Common output
AD11	O	Address output	S14	O	Segment output	S74	O	Segment output	H29	O	Common output
AD10	O	Address output	S15	O	Segment output	S75	O	Segment output	H30	O	Common output
AD9	O	Address output	S16	O	Segment output	S76	O	Segment output	H31	O	Common output
AD8	O	Address output	S17	O	Segment output	S77	O	Segment output	H32	O	Common output
AD7	O	Address output	S18	O	Segment output	S78	O	Segment output	S121	O	Segment output
AD6	O	Address output	S19	O	Segment output	S79	O	Segment output	S122	O	Segment output

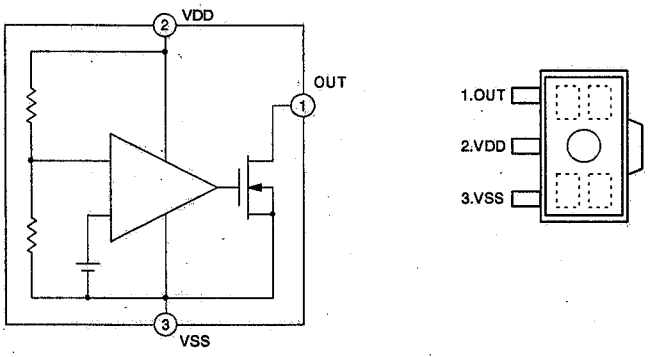
2. Regulator

(Internal block diagram)



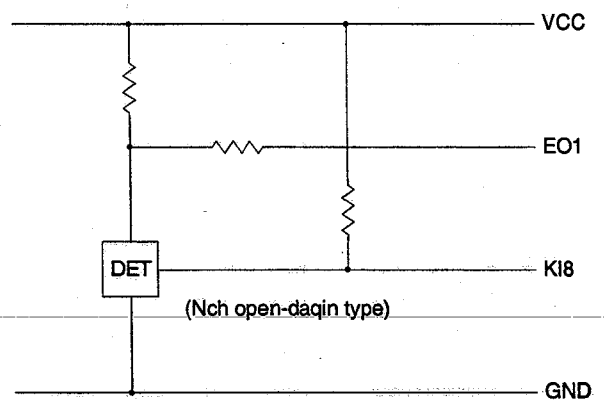
3. Detector

(Internal block diagram)



4. Low voltage detection method

- In this model, a warning is given only to the main battery exhaustion, not given to the backup battery exhaustion.
  The main battery exhaustion is detected in the circuit shown below:



1) Caution level (detection voltage: About 4.8 ~ 5.3V)

- When the caution level is detected while displaying, the low battery symbol (BATT) is lighted.
- When the caution level is detected on supplying the power to the set or on pressing the reset switch, the battery replacement indication (PLEASE REPLACE THE OPERATING BATTERY !) is displayed for about 4 sec.
- When the caution level is detected while sounding the alarm or key input sound, the alarm sound or key input sound is stopped.

2) Fatal level (Detection voltage: About 4.4 ~ 4.8V)

- When the fatal level is detected while displaying, the whole system is turned off.
- When the fatal level is detected, on supplying the power to the set or on pressing the reset switch, the whole system is turned off.
- When the fatal level is detected while sounding the alarm sound or key input sound, the alarm sound or key input sound is immediately stopped. After 100ms, the voltage is restored and the next process is performed.
- When the fatal level is detected while the power is off, pressing the ON key will not supply power to the set. The reset key is also disabled. (Until the battery is replaced.)

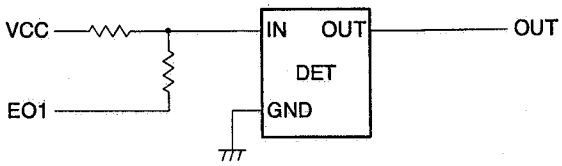
[Note] Since low voltage detection is not performed for the memory protection battery, please note the battery replacement label and replace when necessary.

5. Alphabet: Caps/Low

- Caps/Low of alphabet can be selected by pressing the CAPS key.
- When the power is supplied by pressing the ON key, Caps is selected. (Caps symbol is lighted.)

● Circuit

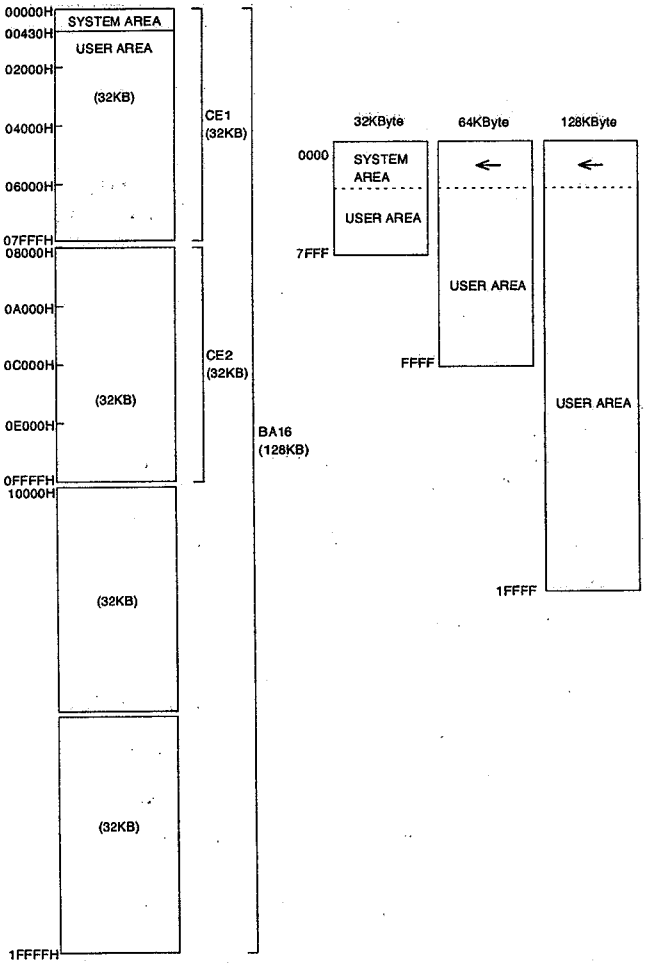
- This circuit has no hysteresis characteristics.



● Software

1. Caution level is detected every 0.5sec. (EO1 = GND)
2. In normal cases, only the fatal level is detected. (EO1 = Vcc)
3. Even when the system is off, the fatal level is detected.

6. Memory map



7. Current check

(VCC = 6.0V)

1. Press the OFF key.
2. Measure the current value. (After 1 sec.)
   When OFF: 15μA or less
3. Press the ON key.
4. Measure the current value.
   When ON: 50mA or less

8. Note for Battery replacement

Replacing batteries

Batteries used in the Organizer:

Type	Model	Qty.	Use
Lithium battery	CR2032	2	Unit operation
Lithium battery	CR2032	1	Memory backup

The standard built-in clock is powered by the operating batteries.

Precautions when replacing the batteries.

Before replacing the battery, be sure to press OFF to turn the power off.

Do not replace the memory backup battery when the operating batteries are depleted. When the operating batteries become weak and you turn the power on, " BATT " will be displayed and the following display will appear temporarily:

<CAUTION>

REPLACE THE OPERATING BATTERIES!

If the batteries become weaker (the alarm or the key beep does not sound), the power may go off during operation or the Organizer may fail to turn on.

The memory contents will still be retained by the memory backup battery.

Replace the operating batteries to avoid loss or alteration of data.

Before removing the batteries for replacement, record important information on paper.

9. Using the data transfer function

This Organizer can transfer data to and from the following models.

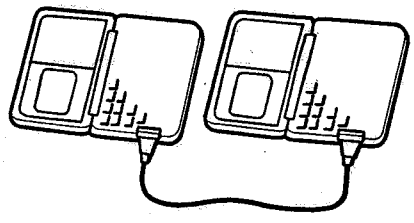
- Other ZQ-4450 Organizers using the optional CE-200L or CE-300L cable.
- The IQ-8000, IQ-7000, ZQ-5000, ZQ-3000, ZQ-2000 and ZQ-6000 series Organizers using the optional CE-200L or CE-300L cable.
- The ZQ-1000, EL-6100 series and EL-6260 Organizers (including Auto Dialer) using the optional CE-220T cable.

Transferable data varies according to the model connected to the Organizer.

Model connected to the ZQ-4450	Transferable data					
	SCHEDULE	TEL	MEMO	TO DO	ANNIVER-SARY	EXPENSE
IQ-8000 series IQ-7000 series ZQ-5000 series ZQ-2000 series	Yes	Yes	Yes	Yes (IQ-8500M, IQ-8400 models only)	—	—
ZQ-6000 series	Yes	Yes	Yes	Yes	—	—
ZQ-4450 ZQ-3050/ZQ-3250	Yes	Yes	Yes	Yes	Yes	Yes
ZQ-2650/ZQ-2850	Yes	Yes	Yes	—	Yes	Yes
ZQ-1000 series	Yes	Yes	Yes	—	—	Yes
EL-6100 series	Yes	Yes	—	—	—	—
EL-6260	—	Yes	—	—	—	—

There may be some data transfer restrictions between these models.

Before connecting the cable and transferring data between Organizers, turn off both units.



Notes:

- To interrupt data transfer, press [ON].
- It a connector is disconnected, or a similar problem occurs during data transfer, the message "I/O DEVICE ERROR" will appear. Press [C·CE] to clear the error.
- After data transfer, the data on the transmitter is preserved.
- There may be a voltage level difference between the connected Organizers which may cause the display contrasts to change. Should this occur, readjust the contrast as required.

Transferring data between ZQ-4450 Organizers

Data in the SCHEDULE, ANNIVERSARY, TEL, MEMO, TO DO and EXPENSE modes can be transferred. The data is transferred and verified by mode (all entries in a mode or a directory – TEL 1, TEL 2, TEL 3) or by entry. In addition, data can be backed up.

Transferring data by mode or by entry

During mode transfer, data previously stored in the specified mode of the receiver are deleted. Proceed with caution.

Note: When mode transfer is carried out in the TEL mode, all listings in the specified directory will be transferred. (In this case, the directory file name is transferred at the same time.)

1. Select the mode on the transmitter and receiver.

   [SCHEDULE] [C·CE] (Transmitter)

   [SCHEDULE] (Receiver)

2. Select the data transfer function on the receiver.

   [2nd] [OPTION]

3. Select "2 RECEIVE" to set the unit in the receive mode.

   2

   ```
   <UNIT TO UNIT>
   RECEIVING
   MODE
   ```

4. Select the data transfer function on the transmitter.

   [2nd] [OPTION]

   Note: To transfer a single entry display the desired entry and press [2nd] [OPTION].

5. Select "1 SEND" to transfer data.

   1

Notes:

- If the mode of the transmitter and the mode of the receiver are not the same, data transfer is not established. The message "DATA ERROR" is displayed.
  When transferring TEL data, directories on the transmitter and receiver can be different. The contents received by the receiver will be stored in the open directory. For example, if TEL 1 is selected on the transmitter and TEL 3 on the receiver before the data transfer is established, the contents of TEL 1 will be sent to and stored in TEL 3.
- Turn off the SECRET function on both the transmitter and the receiver before mode transfer.
- If the amount of memory available on the receiver at the time of transfer is insufficient, data transfer is not possible. The message "MEMORY FULL" appears. Delete any unnecessary data, verify whether the available memory is sufficient, and repeat the data transfer procedure.
- If an error message appears while transferring data, press [C·CE] to clear the error.

Transferring backup data

All the contents of the Organizer are transferred. During backup data transfer, data stored on the receiver are deleted. Proceed with caution. (Backup data transfer is only possible between identical products.)

1. Select the data transfer function on the receiver and set it in the receive mode for backup data transfer.

   [2nd] [OPTION]
   [2nd] 2

   ```
   <UNIT TO UNIT>
   BACKUP
   RECEIVING
   MODE
   ```

2. Select the data transfer function on the transmitter and perform backup data transfer.

   [2nd] [OPTION] [2nd] 1 Y

Verifying data

It is possible to verify data by mode or by entry. If any discrepancies are found, the message "VERIFY ERROR" is displayed.
Verify data in the SCHEDULE mode.

1. Select the mode on the transmitter and the receiver.

   [SCHEDULE] [C·CE] (Transmitter)

   [SCHEDULE] (Receiver)

2. Set the receiver in the verify mode.

   [2nd] [OPTION] 3

   ```
   <UNIT TO UNIT>
   –VERIFYING–
   ```

3. Select the data transfer function on the transmitter.

   [2nd] [OPTION]

   Note: To verify an entry, display the entry to be verified and press [2nd] [OPTION].

4. Perform verification.

   1

Transferring data with another ZQ series or IQ series Organizer

Data transfer restrictions

There are some restrictions when transferring data with any ZQ series Organizer other than the ZQ-4450 or the IQ series Organizers (previously shown). These restrictions result from differences in functions and the maximum allowable size of an entry between the Organizers.

When transferring SCHEDULE data from ZQ-6000 series, IQ-8000, IQ-7000 or ZQ-5000 series Organizers

- Any alarms set on SCHEDULE data transferred from the ZQ-6000, ZQ-8000, IQ-7000 or ZQ-5000 series Organizers, regardless of their precise setting time for specific event, will be set to the event's starting time on the ZQ-4450.

When transferring data from ZQ-6000 or IQ-8000 series Organizers

- When transferring an entry from the ZQ-6000 or IQ-8000 series to the ZQ-4450, the maximum allowable size of the transferred entry is as follows:
  TEL mode: 537 characters
  SCHEDULE mode: 523 characters
  MEMO mode: 544 characters
  TO DO mode: 530 characters
  If an entry exceeding these limits is sent to the ZQ-4450, "I/O DEVICE ERROR" appears and the transfer will not be successful.
  The maximum number of characters that can be edited after an entry is transferred to the ZQ-4450 is 514 in the TEL mode and 512 in the SCHEDULE, MEMO and TO DO modes. Entries exceeding these limits can be displayed but cannot be edited. Those exceeding 515 characters can neither be displayed nor edited.
- Mode transfers from the ZQ-6000 series and IQ-8000 series can be performed even when the maximum length of an entry exceeds the character limits specified above. However, to display and edit data, the number of characters must be within these limits.
- TEL free field contents can be received and displayed on the ZQ-4450, but are deleted once the edit mode is entered.

When transferring TO DO data from ZQ-6000 series, IQ-8500M or IQ-8400 Organizers

- When a TO DO entry is transferred from the ZQ-6000 series or IQ-8500M/IQ-8400 to the ZQ-4450, the contents of the date and category fields are deleted and only the contents of the description and priority fields are received.
- When transferring TO DO data by mode from the ZQ-6000 series or IQ-8500M/IQ-8400 to the ZQ-4450, entries are stored in the ZQ-4450 without date or category field contents. If the transferred data includes an entry with a date, the priority of all transferred entries will be a space. The contents of the priority field are received correctly only when none of the transferred entries contain a date.
- No data verification can be carried out.

When transferring data to and from ZQ-1000 series Organizers

- All characters transferred from the ZQ-4450 are displayed in capital letters on the ZQ-1000 series. Characters and symbols that cannot be displayed on the ZQ-100 series appear as "■".
- EXPENSE data transferred between the ZQ-4450 and the ZQ-1000 series is stored on the receiving unit without payment type data.
- When transferring EXPENSE data by mode from the ZQ-1000 series to the ZQ-4450, an "I/O DEVICE ERROR" may occur. This will occur when there is not enough memory space to be assigned as payment type data area, which EXPENSE data from the ZQ-1000 series does not have. If the error occurs, delete unnecessary data on the ZQ-4450 to increase free memory, then transfer the data again. Once an "I/O DEVICE ERROR" occurs, all EXPENSE data transferred to the ZQ-4450 before the error is cleared.
- When transferring EXPENSE data by mode from the ZQ-1000 series to the ZQ-4450, no data verification can be carried out.

Transferring data by mode or by entry

Transfer the "ABC BANK" memo stored in the Organizer.

1. Recall the memo to be transferred on the transmitter.
   [MEMO] [∨]

   Note: To perform mode transfer, select the mode by pressing the mode key, and then press [C·CE]. It is not necessary to display an entry.
2. Select the data transfer function on the receiver, and set it in the receive mode.
3. Select the data transfer function on the transmitter and perform data transfer.
   [2nd] [OPTION] 1

Notes:

- Follow the same steps to transfer data from another ZQ or an IQ series Organizer.
- Notes described on page 4 also apply here.
- When transferring data to/from another ZQ series or an IQ series Organizer, the display contrast of the ZQ-4450 Organizer decrease when the units are connected.

Verification

Follow the steps explained in "Transferring data between ZQ-4450 Organizers" above.

Transferring data with an EL series Organizer (including Auto Dialer)

For the EL-6100 series Organizer, TEL data and SCHEDULE data can be transferred. For the EL-6260 Auto Dialer, TEL data can be transferred.
Data is transferred by mode or by entry.

Data transfer restrictions

When transferring data with an EL series Organizer (including the Auto Dialer), the following restrictions apply:

When transferring data to an EL series Organizer

- Transferred data is added to previously stored data.
- Data is transferred in the same mode and directory.
- If a transferred entry exceeds the maximum number of characters that can be entered into the EL series Organizer as one entry, excess characters are deleted.
- Characters and symbols that cannot be displayed on the EL series Organizer are replaced by spaces. If all the columns that can be displayed are replaced by spaces, the corresponding entry is not stored.
- All letters are converted to capital letters on the EL series Organizer.
- If the SECRET function is turned on in the ZQ-4450, only non-secret data can be transferred.

When transferring data from an EL series Organizer

- The received data are added to previously stored data.
- All non-English characters are converted to small letters.
- If the SECRET function is turned on in the EL series Organizer, only non-secret data can be transferred.

Transferring data to an EL series Organizer

Transfer all TEL 1 data in the Organizer to TEL 1 in the EL series Organizer.

1. Set the receiver in the receive mode.
2. Select the mode on the transmitter.
   [TEL]
   (Select the desired directory.)

3. Select the data transfer function on the transmitter.

   [2nd] [OPTION].

   Note: To transfer an entry, display the entry to be transferred and press [2nd] [OPTION].

4. Perform data transfer.

   1

- If the amount of memory available in the receiver at the time of data transfer is insufficient, an error message appears. Delete any unnecessary data, verify that there is sufficient memory available, and repeat the procedure.

Transferring data from an EL series Organizer

1. Select the mode on the receiver.
2. Select the data transfer function on the receiver, and set it in the receive mode.
3. Perform data transfer from the transmitter.

Exchanging data with a personal computer

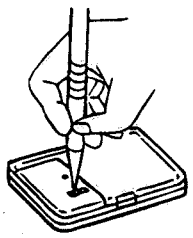
With Sharp's Organizer Link software and cable package, you can exchange data with a personal computer. The link is made via the 4-pin computer-link port on the left side of the Organizer using an interface cable to suit your computer. See the Organizer Link manual for connection and software operating details.

Note: Sharp's Organizer Link software may not be available at the time you purchase this Organizer. Check with your local Sharp dealer concerning availability.

10. Reset procedure

When trouble occurs

An impact or a strong external electrical field may leave none of the keys operational. Press the RESET switch on the back of the Organizer.



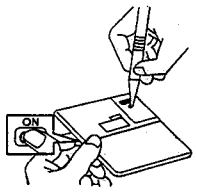
The impact or external electrical field may erase some or all of the Organizer's memory.
Press the RESET switch with the tip of a ball-point pen or similar object, but not anything breakable (like a pencil point or a needle).

All RESET operation

If a problem occurs after replacing the batteries, or if the Organizer does not function properly even after the above RESET operation, perform the following:

1. While holding [ON], press the RESET switch on the back. Release the RESET switch and then release [ON].

   The following display will appear.




```
CLEAR ALL DATA
OK (Y/N) ?
```

2. Press [N].
   Returns to the initial display.

Caution: Do not press [Y] in step 2. Pressing [Y] will delete all data stored in the Organizer and reset the built-in clock.

11. Contrast adjustment

Adjust the display contrast to make the display easier to read.

1. Press [2nd] [FUNCTION].

```
< FUNCTION >
1 MEMORY CHK
2 LCD
3 DATA DEL
              ↓
```

2. Select "2 LCD CONT".

   2

```
LCD CONT

▼ – DARK
▲ – LIGHT
```

3. Press [▲] or [▼] to darken or lighten the display as required. The amount of contrast will change continuously when either [▲] or [▼] is held.
4. After adjusting the contrast, press [C·CE].

12. Turning the "beep" on and off

While " ♪ " is displayed, a "beep" will sound when a key is pressed. To turn the "beep" on and off, press [2nd] [♪]. The "beep" will not sound after " ♪ " goes off. To turn the "beep" back on, repeat the process.

13. Difference between the ZQ-3000 series

- Display film calendar

Ⓐ type (The left end is Sunday.)

	SUN	MON	TUE	WED	THU	FRI	SAT
'95	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
1	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				

CAPS ♪

ZQ-4400

Ⓑ type (The left end is Monday.)

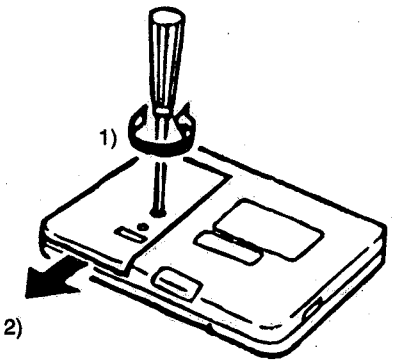
	MON	TUE	WED	THU	FRI	SAT	SUN
'95							1
	2	3	4	5	6	7	8
1	9	10	11	12	13	14	15
	16	17	18	19	20	21	22
	23	24	25	26	27	28	29
	30	31					

CAPS ♪

ZQ-4450

14. Note for servicing

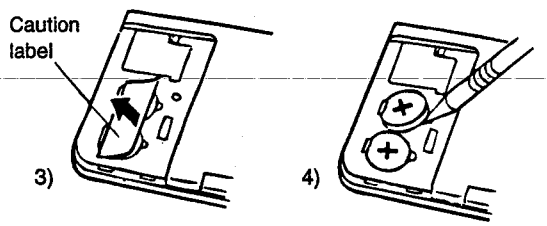
■ Remove the battery cover.



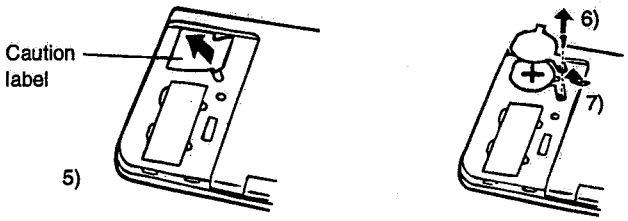
1) Loosen screw.
2) Remove battery cover.

(Note) Screw is so constructed as not to be removed for prevention against missing.

■ Remove the battery.



3) Remove caution label.
4) Remove the battery. (MAIN side)



5) Remove caution label.
6) Remove the screw.
7) Remove battery protect, and remove the battery. (Backup side)

(Note) There is a screw beneath battery protect. When removing the keyboard lower cabinet, battery protect must be removed.

15. Diag Specifications

1. Entering Diag mode

Keep pressing ON + D keys and reset the machine, and the DIAG menu display shown below will appear.

Pressing 0 cancels DIAG and returns to TEL 1 mode.
Pressing 1 starts the LCD check program.
Pressing 2 starts the PCB check (RAM check) program.
Pressing 3 starts the production process check program.
Pressing 4 starts the static electricity check program.
Pressing 5 starts the intermittent aging program.
Pressing 6 starts the low battery check program.
Pressing 7 starts the safety standard system communication program. Pressing 9 turns OFF normally.

1	LCD	5	PT AGING
2	PCB	6	LB
3	SET	7	EMI
4	ESD		

Note: When entering the diag mode, user's data will be destroyed. Be sure to back up the necessary data before entering the diag mode.

2. Diag contents

(1) When LCD is selected:

I. A frame is displayed in one dot width around the outer peripheral of the LCD. (Pressing the Enter key goes to the next screen.)

II. Zigzag pattern 1 is displayed. (Pressing the Enter key goes to the next screen.)

III. Zigzag pattern 2 is displayed. (Pressing the Enter key goes to the next screen.)

IV. The vertical line pattern is displayed. (Pressing the Enter key goes to the next screen.)

V. The horizontal line pattern is displayed. (Pressing the Enter key goes to the LCD density control check screen.)
During displaying of the LCD check in I to V, the density control can be performed with ▲ and ▼ keys. If possible, the most appropriate density is automatically performed for each screen.
In the case of II and IV, the following symbol will light.

BATT 30: 31: EDIT 2nd CAPS * S ♪ ↑ ↓

In the case of III and V, the following symbols will light.

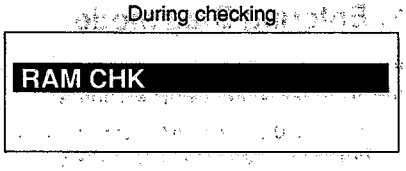
30 31

VI. The LCD density control check is performed. (Pressing the Enter key goes to the menu display screen.)
After displaying the horizontal pattern, the LCD density is automatically adjusted.

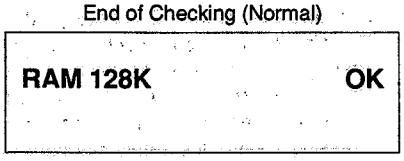
(2) When PCB is selected:

Wiring of (1) RAM is checked, and WRITE/READ of (2) A5h and (3) 5Ah are performed for the whole RAM area to perform the RAM bit failure check. After checking, the RAM capacity is displayed. In case of an NG, the check where the NG occurred is also displayed. However, an error may caused by the defective device.

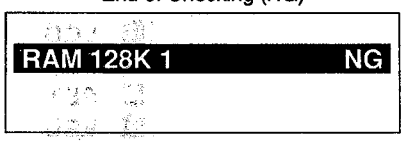
During checking



End of Checking (Normal)



End of Checking (NG)



When the check is completed normally, press the Enter key to return to the menu display screen. In case of an error, press 2nd + CCE keys to return.

(3) When SET is selected:

This item is for production process test, and is not required for servicing.

(4) When ESD is selected:

This item is for production process test, and is not required for servicing.

(5) When PT AGING is selected:

The following procedures II to IV are repeated without stop. To terminate, press the RESET key. When the battery voltage falls under the CAUTION level, set the communication output port to HIGH.
During this procedure, even during displaying, the machine operates at the full power.

I. A5h is written to the whole area of RAM.

II. The zigzag display is shown for 2 sec, and the reversed display is shown for 2 sec.

III. The value written in the RAM is checked. At that time, the reversed zigzag display is kept.

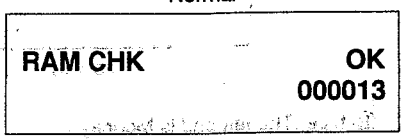
Required time: RAM 32 Kbyte, about 1.1 sec
RAM 64 Kbyte, about 2.1 sec
RAM 128 Kbyte, about 4.2 sec
RAM 256 Kbyte, about 8.4 sec

IV. The results of the above RAM checks are displayed as shown below:

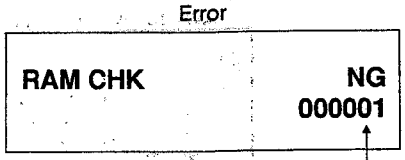
In normal procedure, the display is kept for
RAM 32 Kbyte, about 72 sec
RAM 64 Kbyte, about 92 sec
RAM 128 Kbyte, about 123 sec
RAM 256 Kbyte, about 186 sec.

Then the operation goes to the next step (under the normal key waiting state). In case of an error, the aging is stopped at once.
The rough ratio of the operation and the key waiting state is 1 : 1.5.

Normal



Error

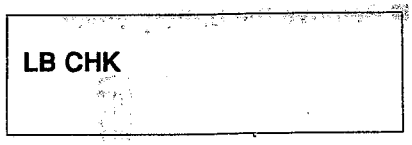


This figure shows the loop number.

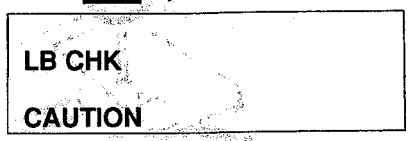
V. The RAM contents are reversed for every 100 times and the operation goes to step II.

(6) When LB is selected:

I. The following display is given and the process of the max. current is performed.



II. When the battery voltage falls below the CAUTION level, the following display is given and BATT symbol is lighted.

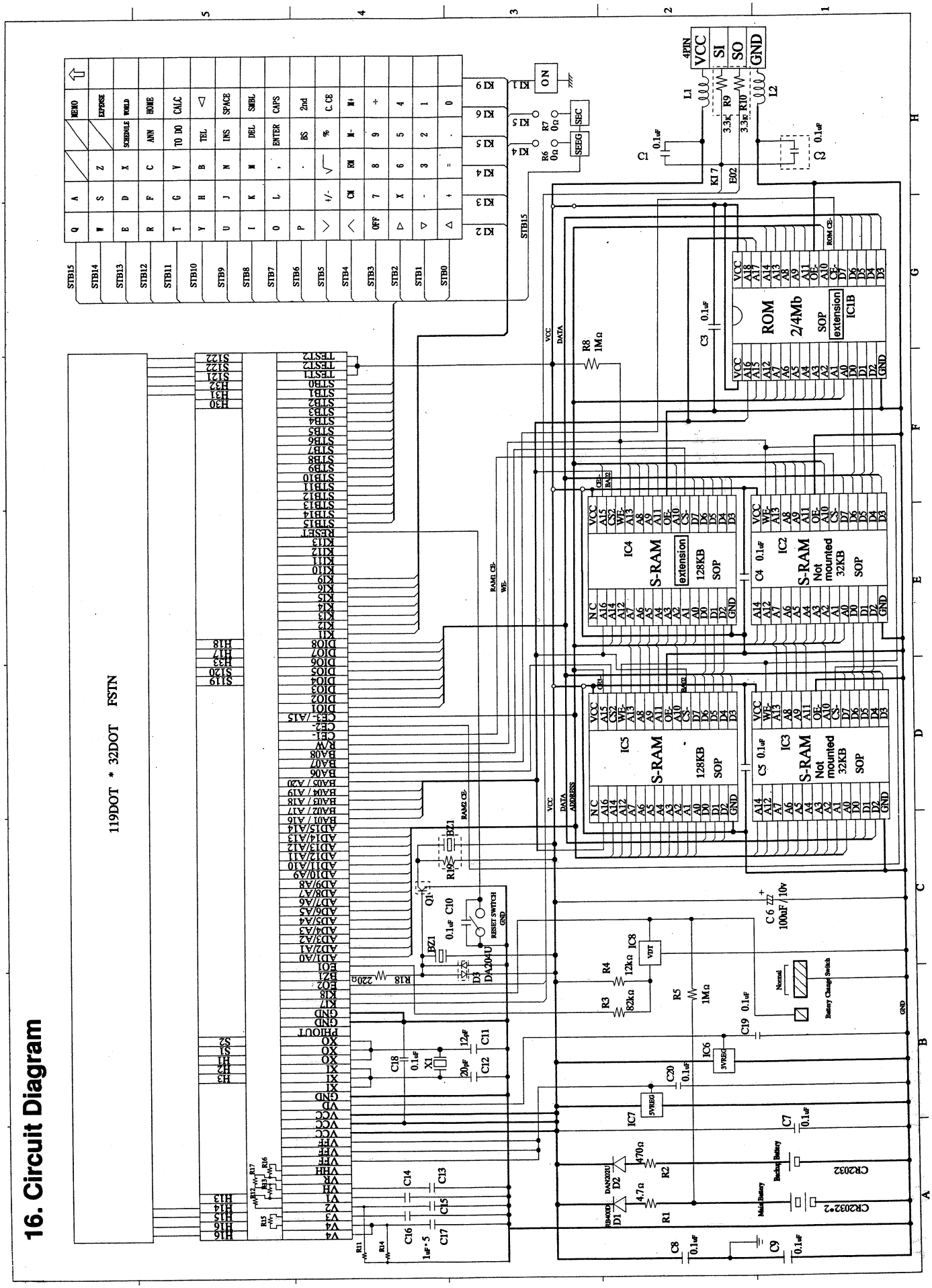


III. When the battery voltage falls below the FATAL level, the operation is turned off. Under this state, no key is valid. To terminate, reset the machine.

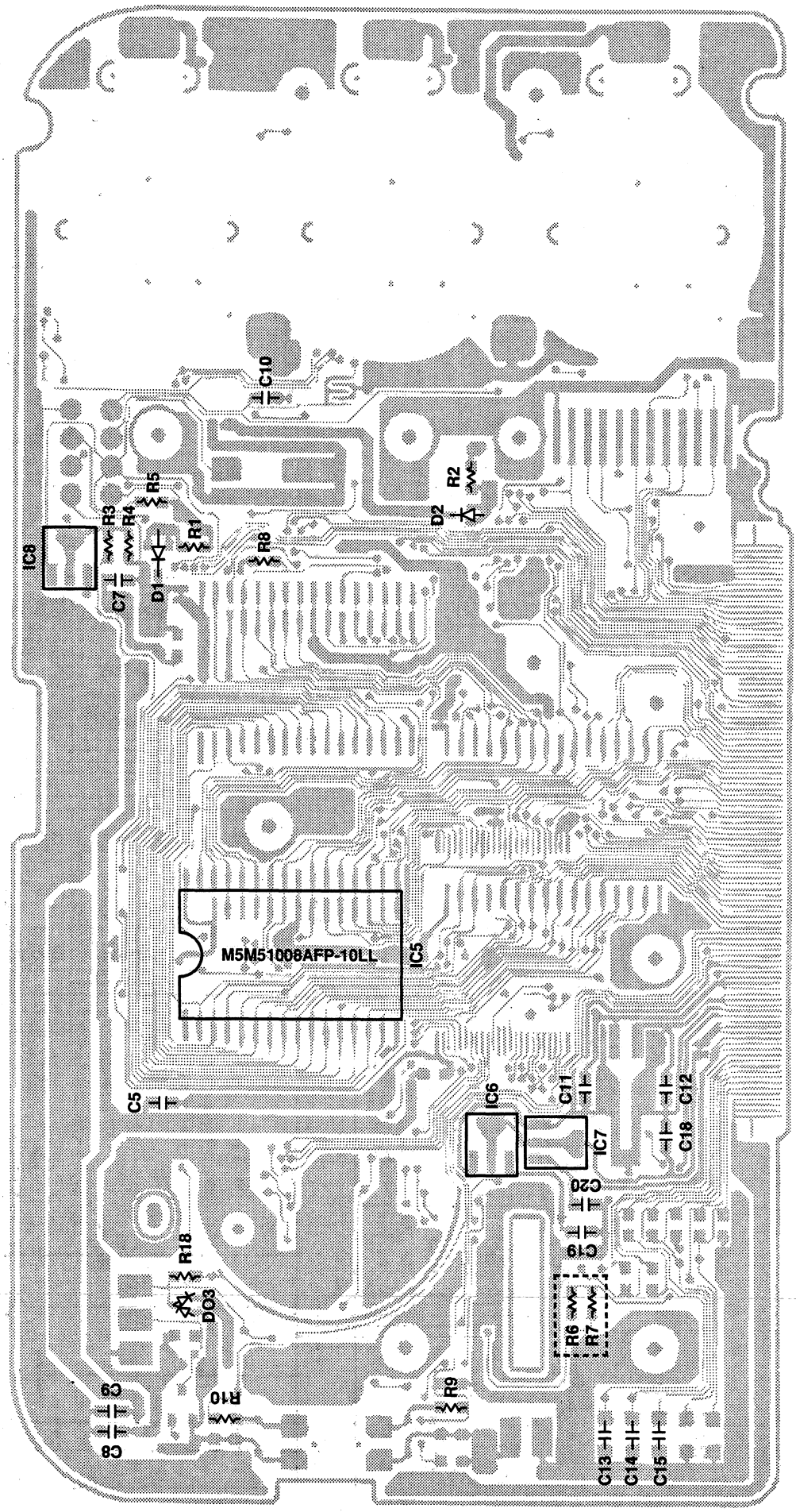
(7) When EMI is selected:

This item is for production process test, and is not required for servicing.

16. Circuit Diagram

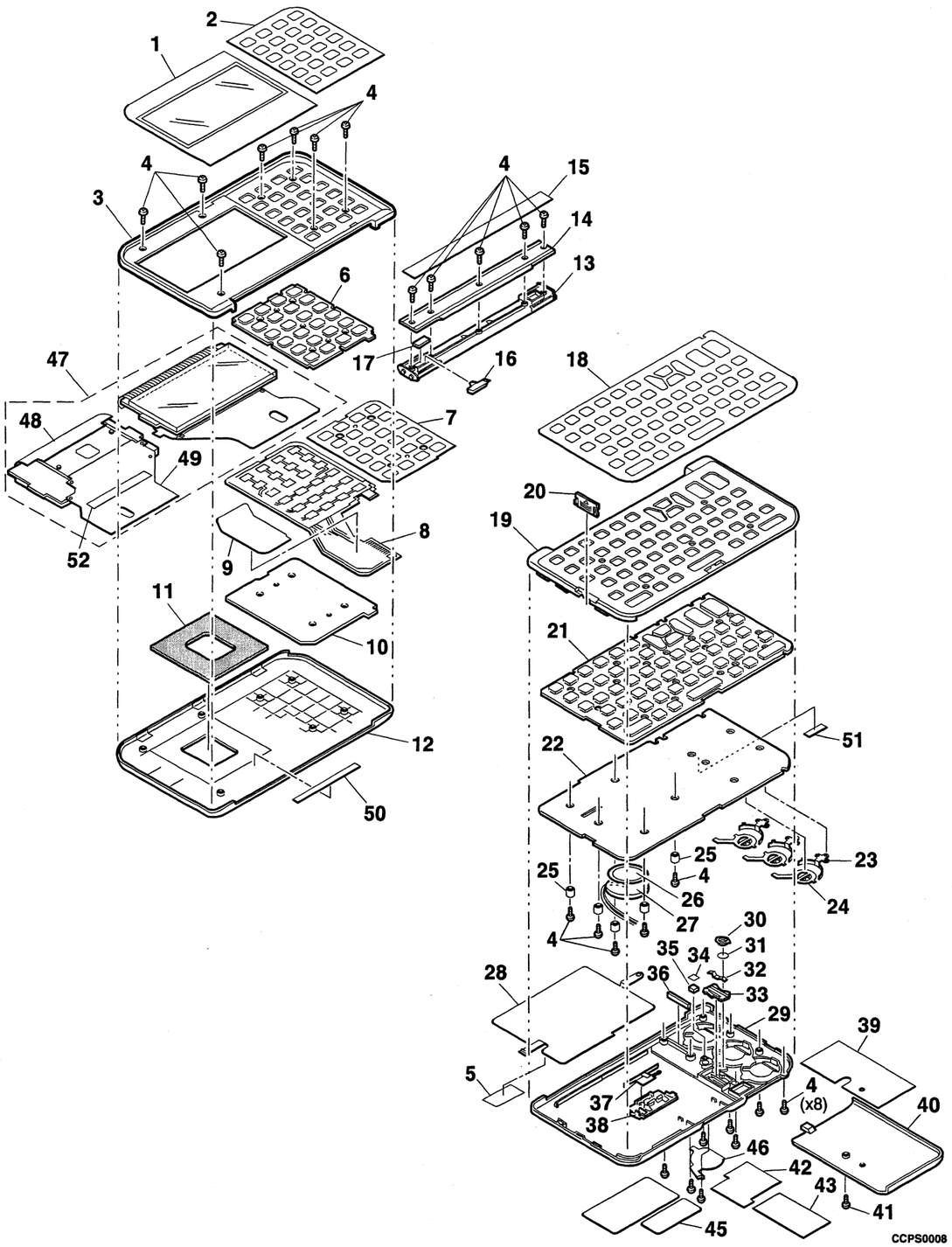


17. PWB parts signals arrangement



NOTE : ZQ-4400 R6 Not installed.
R7 Installed.
ZQ-4450 R6 Installed.
R7 Not installed.

PARTS GUIDE



1 Exteriors

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	ZQ-4400	ZQ-4450
1	PSHEZ1044PCZ1	AH	N	C	Display decoration film	○	
	PSHEZ1044PCZ2	AH	N	C	Display decoration film		○
2	PSHEZ1045PCZZ	AG	N	C	Mode key decoration film	○	○
3	GCABB1040PCZZ	AG	N	D	Display panel	○	○
4	LX-BZ1014PCZZ	AA		C	Screw (M1.7)	○	○
5	PTPEH1055PCZZ	AB		D	Shield plate tape	○	○
6	PGUMM1025PCZZ	AF	N	C	Upper key rubber	○	○
7	PSPAP1041PCZZ	AC	N	C	Key spacer	○	○
8	QPWBH1072PCZZ	AP	N	C	Key sheet	○	○
9	PTPEH1052PCZZ	AC	N	D	Key sheet tape	○	○
10	LFiX-1008PCZZ	AG	N	C	Key sheet holder	○	○
11	PCUSS1010PCZZ	AC	N	C	LCD cushion	○	○
12	GCABC1041PCZZ	AM	N	D	Top cover	○	○
13	MHNG-1002PCZZ	AD	N	C	Upper hinge	○	○
14	MHNG-1001PCZZ	AD	N	C	Lower hinge	○	○
15	PSHEZ1048PCZZ	AB	N	C	Screw hide sheet	○	○
16	LSTPP1005PCZZ	AC	N	C	Hinge stopper	○	○
17	PGUMS1027PCZZ	AB	N	C	Hinge hold rubber	○	○
18	PSHEZ1046PCZZ	AN	N	C	Key decoration film	○	○
19	GCABD1042PCZZ	AH	N	D	Key board panel	○	○
20	GFTAA1010PCZ2	AC	N	D	Connector cover	○	○
21	PGUMM1026PCZZ	AM	N	C	Lower key rubber	○	○
22	DUNTK2039PCZZ	BQ	N	E	Main PWB unit (Include №23,24,26,27,51)	○	
	DUNTK2048PCZZ	BQ	N	E	Main PWB unit (Include №23,24,26,27,51)		○
23	QTANB1030PCZZ	AC	N	C	Battery terminal ⊕	○	○
24	QTANB1019PCZZ	AE		C	Battery terminal ⊖	○	○
25	LBÖS-1002PCZZ	AB	N	C	PWB hold boss	○	○
26	PSHEZ1055PCZZ	AD	N	C	Buzzer spacer	○	○
27	RALMB1030CCZZ	AD		B	Buzzer (EFB-S49C02P)	○	○
28	PSLDC1018PCZZ	AG	N	C	Shield plate	○	○
29	GCABA1043PCZZ	AM	N	D	Bottom cover	○	○
30	PGUMM1693CCZZ	AA		C	Reset rubber	○	○
31	PSPAV1025PCZZ	AA		C	Reset switch cover	○	○
32	QCNTM1056CC02	AB		C	Contact	○	○
33	JKNBZ1022PCZ2	AC	N	C	Battery replace switch	○	○
34	PSHEZ1049PCZZ	AA	N	C	Nut hold tape	○	○
35	LX-NZ1003PCZZ	AC	N	C	Nut (M1.7)	○	○
36	PGUMS1028PCZZ	AB	N	C	Key sheet press rubber	○	○
37	MSPRP1024PCZZ	AC	N	C	Cover lock spring	○	○
38	JKNBZ1039PCZZ	AD	N	C	Cover lock	○	○
39	TLABZ1203PCZZ	AC	N	D	Battery replacement label	○	○
40	GFTAB1025PCZZ	AF	N	D	Battery cover	○	○
41	LX-BZ1023PCZZ	AB	N	C	Screw (M1.7)	○	○
42	TCAUA1005PCZZ	AB	N	D	Back up battery caution label	○	○
43	TCAUA1004PCZZ	AB	N	D	Main battery caution label	○	○
45	TLABZ1202PCZZ	AA	N	D	Battery replacement date label	○	○
46	LFiX-1009PCZZ	AC	N	C	Back up battery holder	○	○
47	DUNT-2142PCZZ	BM	N	E	LCD unit (Include №48,49,52,101~103)	○	○
48	QPWBB1074PCZZ	AH	N	C	PET-B	○	○
49	QPWBB1073PCZZ	AR		C	PET-A	○	○
50	PCUSS1012PCZZ	AB	N	C	PET cushion	○	○
51	PZETL1039PCZZ	AA	N	C	PWB insulate sheet	○	○
52	PTPEH1067PCZZ	AA	N	D	PET tape	○	○
101	PSHEZ1047PCZZ	AC	N	C	LCD holder	○	○
102	PTPEH1053PCZZ	AD		D	B/U tape A (TCP/PWB)	○	○
103	PTPEH1054PCZZ	AB	N	D	B/U tape B (LCD/TCP)	○	○
501	DUNTK2139PCZZ	BU	N	E	PWB unit (Include №22,47)	○	
	DUNTK2140PCZZ	BU	N	E	PWB unit (Include №22,47)		○

2 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	ZQ-4400	ZQ-4450
1	SPAKC1450PCZZ	AE	N	D	Packing case [Canada]	○	
	SPAKC1451PCZ1	AE	N	D	Packing case [other countries]	○	
	SPAKC1452PCZ1	AE	N	D	Packing case [Germany,U.Kingdom]		○
2	SPAKA1467PCZZ	AC	N	D	Packing cushion for SET	○	○
3	SPAK-546ECCZZ	AB		D	Vinyl bag (125×230)	○	○
5	TiNSE1149PCZ1	AN	N	D	Instruction book (English)	○	
	TiNSF1150PCZZ	AN	N	D	Instruction book [Canada]	○	
	TiNSG1151PCZZ	AN	N	D	Instruction book [Germany]		○
	TiNSE1152PCZ1	AN	N	D	Instruction book [U.Kingdom]		○
	TiNSF1189PCZZ	AN	N	D	Instruction book [Germany]		○
6	TGANE1002CS02	AB		D	Warranty card [Canada]	○	
	TGANE1113CCN1	AB		D	Warranty card [Australia]	○	
7	TCADZ1808CCZZ	AA		D	Noise card [Canada]	○	
8	TCADZ1005PC01	AC		D	IC card introduct card [Canada]	○	

[redacted]
ZQ-4400
ZQ-4450

2 Packing material & Accessories

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	ZQ-4400	ZQ-4450
9	PSHEZ1056PCZZ	AC	N	D	Display sheet [Germany]		○
10	SPAKA1468PCZZ	AB	N	D	Packing cushion for inst. book [Germany]		○

3 Main PWB unit

NO.	PARTS CODE	PRICE RANK	NEW MARK	PART RANK	DESCRIPTION	ZQ-4400	ZQ-4450
1	PSHEZ1055PCZZ	AD	N	C	Buzzer spacer	○	○
2	PZETL1038PCZZ	AB	N	C	PET reinforcing tape	○	○
3	PZETL1039PCZZ	AA	N	C	PWB insulate sheet	○	○
4	QCNCM1416CC0D	AE		C	Connector (4pin)	○	○
5	QTANB1019PCZZ	AE		C	Battery terminal ⊖	○	○
6	QTANB1030PCZZ	AC	N	C	Battery terminal ⊕	○	○
7	RALMB1030CCZZ	AD		B	Buzzer (EFB-S49C02P)	○	○
8	RC-EZ107AEC1A	AB		C	Capacitor (10WV 100μF) [C6]	○	○
9	RCRSP1009PCZZ	AD	N	B	Crystal (32.768KHz) [X1]	○	○
10	VCCCTV1HH160J	AA		C	Capacitor (50WV 16PF) [C11]	○	○
11	VCKYTQ1EF105Z	AB		C	Capacitor (25WV 1.0μF) [C13~15]	○	○
12	VCKYTV1CF105Z	AB		C	Capacitor (16WV 1.0μF) [C20]	○	○
13	VCKYTV1EF104Z	AA		C	Capacitor (25WV 0.10μF) [C5,7~10,18,19]	○	○
14	VHDDAN202U//-1	AB		B	Diode (DAN202U) [D2]	○	○
15	VHDDA204U//-1	AB		B	Diode (DA204U) [D3]	○	○
16	VHDRB400D//-1	AC		B	Diode (RB400D) [D1]	○	○
17	VHiRH5RL30AA1	AD	N	B	IC (RH5RL30AA1) [IC6]	○	○
18	VHiRH5RL50AA1	AD	N	B	IC (RH5RL50AA1) [IC7]	○	○
19	VHiRH5VL40AA1	AD	N	B	IC (RH5VL40AA1) [IC8]	○	○
20	VHi51008AFP10	BF		B	IC (51008AFP10) [IC5]	○	○
21	VRS-TS2AD000J	AA		C	Resistor (1/10W 0Ω ±5%) [R7]	○	
	VRS-TS2AD000J	AA		C	Resistor (1/10W 0Ω ±5%) [R6]		○
22	VRS-TS2AD105J	AA		C	Resistor (1/10W 1.0MΩ ±5%) [R5,8]	○	○
23	VRS-TS2AD123J	AA		C	Resistor (1/10W 12KΩ ±5%) [R4]	○	○
24	VRS-TS2AD221J	AA		C	Resistor (1/10W 220Ω ±5%) [R18]	○	○
25	VRS-TS2AD332J	AA		C	Resistor (1/10W 3.3KΩ ±5%) [R9,10]	○	○
26	VRS-TS2AD4R7J	AA		C	Resistor (1/10W 4.7Ω ±5%) [R1]	○	○
27	VRS-TS2AD471J	AA		C	Resistor (1/10W 470Ω ±5%) [R2]	○	○
28	VRS-TS2AD823J	AA		C	Resistor (1/10W 82KΩ ±5%) [R3]	○	○
	(Unit)						
901	DUNTK2039PCZZ	BQ	N	E	Main PWB unit	○	
	DUNTK2048PCZZ	BQ	N	E	Main PWB unit		○

SHARP

Date : Apr. 26, 1995

ELECTRONIC ORGANIZER : ZQ-4450/4450M

No. : EO-070

Technical Report

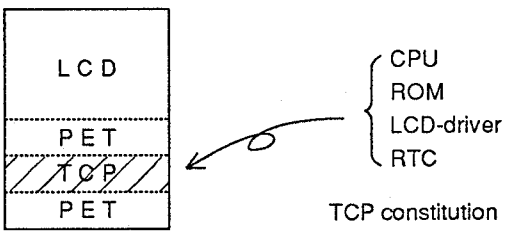
1602

CHANGE IN LCD UNIT AND PWB UNIT

1.Model name: ZQ-4450/4450M

2.General:

When the C.CE key of the models listed above is depressed 3 times, the calander display shifts out of position due to an error in the software.
To alleviate this problem, the ROM in the TCP has been changed. In accordance with this change, the PWB unit and the LCD unit, which are offered as service parts, have also been changed.



TCP constitution

3.Parts changes:

Ref. No.	Model name	Version	P/G No.	Current parts	New parts		Parts name	Effective time	Interchangeability	Note
				Parts code	Parts code	Price rank				
1	ZQ-4450	Germany UK	1 -501	DUNTK2140PCZZ	DUNTK2228PCZZ	BV	PWB-UNIT	'95/2	3	
			1 -47	DUNT-2142PCZZ	DUNT-2229PCZZ	BN	LCD-UNIT	'95/2	3	
	ZQ-4450M	Germany	1 -501	DUNTK2126PCZZ	DUNTK2230PCZZ	BV	PWB-UNIT	'95/2	3	
			1 -47	DUNT-2127PCZZ	DUNT-2231PCZZ	BN	LCD-UNIT	'95/2	3	

<Interchange>

1. Interchangeable.	4. Not interchangeable.
2. Current type can be used in place of new type. New type cannot be used in place of current type.	5. Interchangeable if replaced with same types of related parts in use.
3. Current type cannot be used in place of new type. New type can be used in place of current type.	6. Others.

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP

Date : Apr. 26, 1995

ELECTRONIC ORGANIZER : ZQ-4450M

No. : EO-068

Technical Report

1602

CHANGE IN MODEL LABEL

1.Model name: ZQ-4450M

2.General: The model label has been changed due to a printing error concerning the electrical consumption of the unit.

3.Parts changes:

Ref. No.	Model name	Version	P/G No.	Current parts	New parts		Parts name	Effective time	Interchangeability	Note
				Parts code	Parts code	Price rank				
1	ZQ-4450M	Germany	[1] -54	TLABM1239PCZZ	TLABM1239PC01	AB	Model label	'94/11	3	

<Interchange>

1. Interchangeable.	4. Not interchangeable.
2. Current type can be used in place of new type. New type cannot be used in place of current type.	5. Interchangeable if replaced with same types of related parts in use.
3. Current type cannot be used in place of new type. New type can be used in place of current type.	6. Others.

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.

SHARP

Date : May. 8, 1995

ELECTRONIC ORGANIZER : YO-350/370, ZQ-4400/4450/4450M

No. : EO-072

Technical Report

1602

ADDITION OF A CHIP CAPACITOR

1.Model name: YO-350/370, ZQ-4400/4450/4450M

2.Genaral: A 2,200 PF chip capacitor has been added to the models listed above to alleviate the problem of clock errors which had occurred.

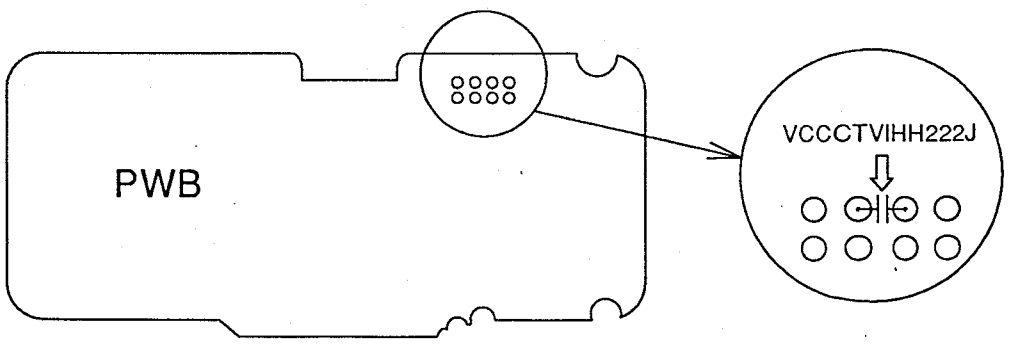
3. Parts changes:

Ref. No.	Model name	Version	P/G No.	Current parts	New parts		Parts name	Effective time	Interchangeability	Note
				Parts code	Parts code	Price rank				
1	YO-350 YO-370	U.S.A	—	—	VCCCTV1HH222J	AB	Chip capacitor	'94/11	6	Added parts: 0 → 1
	ZQ-4400	Canada Australia New Zealand The others	—	—	VCCCTV1HH222J	AB	Chip capacitor	'95/1	6	
	ZQ-4450	Germany England	—	—	VCCCTV1HH222J	AB	Chip capacitor	'94/11	6	
	ZQ-4450M	Germany	—	—	VCCCTV1HH222J	AB	Chip capacitor	'94/11	6	

<Interchange>

1. Interchangeable.	4. Not interchangeable.
2. Current type can be used in place of new type. New type cannot be used in place of current type.	5. Interchangeable if replaced with same types of related parts in use.
3. Current type cannot be used in place of new type. New type can be used in place of current type.	6. Others.

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.



SHARP

Date : Aug. 4, 1995

ELECTRONIC ORGANIZER : ZQ-4450M

No. : EO-078

Technical Report

m gd 1602

A CHANGE TO THE OPERATION MANUAL

1.Model Name: ZQ-4450M

2.General: For the models indicated above, a CE-Mark statement has been added to the operation manual. This has been done in compliance with the regulations for CE-Marks (safety labels)

3.Part changes:

Ref. No.	Model name	Version	P/G No.	Current parts	New parts		Parts name	Effective time	Interchangeability	Note
				Parts code	Parts code	Price rank				
1	ZQ-4450M	France	[2] -5	TINSF1197PCZZ	TINSF1197PC01	AN	Operation manual	1st lot '95/6	3	
		Germany		TINSG1182PCZZ	TINSG1182PC01					

<Interchange>

1. Interchangeable.	4. Not interchangeable.
2. Current type can be used in place of new type. New type cannot be used in place of current type.	5. Interchangeable if replaced with same types of related parts in use
3. Current type cannot be used in place of new type. New type can be used in place of current type.	6. Others.

Parts marked with "⚠" is important for maintaining the safety of the set. Be sure to replace these parts with specified ones for maintaining the safety and performance of the set.